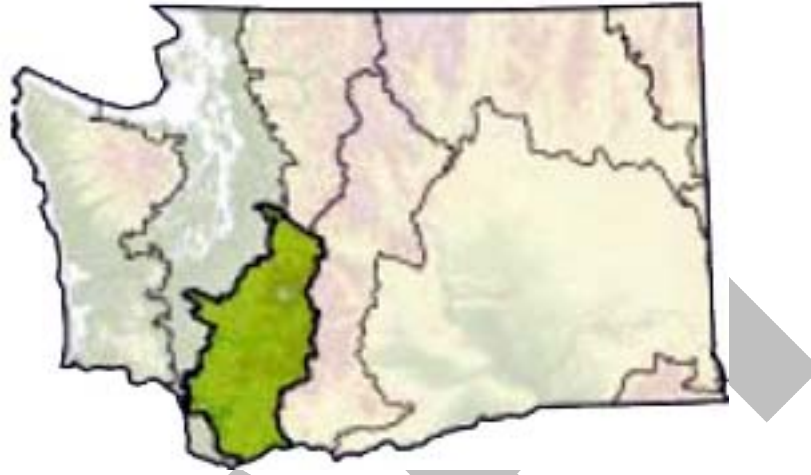


WEST CASCADES ECOREGION



PHYSIOGRAPHY AND BIODIVERSITY

Geography

The West Cascades ecoregion extends west from the Cascade crest to the Puget lowlands and from Snoqualmie Pass southward to the Columbia Gorge. The Washington portion of the ecoregion encompasses approximately eight percent of the state. As of 1991, less than two percent of the Washington portion of the ecoregion had been converted to urban and/or agricultural use.

Geology

The West Cascades ecoregion consists mostly of highlands modified by montane glaciers and associated riverine valleys. The typical elevation range is 1,000 to 7,000 feet above sea level, with the highest peaks rising to more than 14,000 feet on Mount Rainier and the lowest elevations in the Columbia River Gorge at 50 feet. Isolated volcanic peaks such as Mount St. Helens and associated high plateaus rise above surrounding steep mountain ridges. These mountain peaks were formed primarily from extrusive volcanic activity. Small, steep-gradient streams feed major rivers. Natural lakes are frequent and most were created by glacial processes and landslides.

Climate

The climate of this ecoregion is wet and relatively mild. Average annual precipitation ranges from about 55 to 140 inches. Most precipitation accumulates from October through April as snow and rain. High elevations in the mountains are continuously covered with snow for months. Middle elevations have significant snow pack that fluctuates over the course of the winter with rain-on-snow events. The lowest elevations accumulate little snow and generally have a transient snow pack.

Habitat and Plant Associations

Conifer forests dominate the vegetation of the West Cascades ecoregion. Douglas-fir/western hemlock forests are typical at low elevations. Middle elevations characteristically have Pacific silver fir, western hemlock, Douglas-fir, and noble fir. High elevations have

mountain hemlock/silver fir forests and subalpine parklands. Higher elevations on volcanic peaks support alpine heath, meadows, and fellfields (stony habitats with low mat and cushion plants) among glaciers and rock. Special habitats include riparian areas dominated by broadleaf species, wetlands, grassy balds, and oak woodlands. Areas surrounding Mount Rainier support a few endemic rare plant species, as does the Columbia River Gorge. Both are areas of high plant diversity. The Columbia River Gorge has added biogeographic significance because of the mixing of coastal and interior plant species.

Although portions have been extensively managed for timber harvest, the biodiversity of the West Cascades ecoregion is relatively intact and dominated by natural or semi-natural vegetation. One of Washington's highest concentrations of rare plants occurs in the ecoregion, in the Columbia River Gorge. The southern portion of the ecoregion contains fescue grasslands that attract the mardon skipper, a federal candidate butterfly more commonly associated with the Puget Trough ecoregion.

Biodiversity

Species richness is not as high in the West Cascades ecoregion as it is in other temperate conifer forests, but the ecoregion is notable for comparatively high amphibian species endemism (species occurring only in a specific locale). Five of the ecoregion's 11 endemic species are amphibians and include the coastal giant salamander, Cascade seep salamander, Oregon slender salamander, Larch Mountain salamander, and the Cascades frog. Most of these species are closely associated with fast-moving, cold mountain streams. Some of the larger carnivores have been extirpated from the ecoregion, including gray wolf and grizzly bear, while others such as the mountain lion and black bear persist. Mammal species of concern in the ecoregion are the fisher, western gray squirrel, and wolverine. Other important inhabitants include more than 7,000 species of arthropods, as well as slugs.

Several other species that occur in the West Cascades ecoregion, including the Cascade torrent salamander, Columbia spotted frog, chinook salmon, bull trout, northern spotted owl and marbled murrelet, have been the focus of conservation attention because of their close association with declining habitat types such as aquatic areas, seeps, talus slopes, and old growth and riparian forests.



LAND USE AND OWNERSHIP

Approximately 65 percent of the West Cascades ecoregion is publicly owned. The U.S. Forest Service manages approximately 87 percent of the public land, within the Gifford Pinchot National Forest, the Mt. Baker-Snoqualmie National Forest and the Mount St. Helens Volcanic Monument. A significant percentage of the Gifford Pinchot National Forest is within designated wilderness. The Bureau of Land Management manages another seven percent, and the National Park Service another six percent within Mt. Rainier National Park. Most of the remaining public land is managed by the Washington Department of Natural Resources. Outside the Interstate 5 corridor and the greater Vancouver metropolitan area, much of the private land in the West Cascades ecoregion is owned by private timber companies.

"Protected" sites in this ecoregion are primarily contained within the remaining intact habitat blocks discussed above, as well as several late-succession forest reserves administratively protected under the Northwest Forest plan for the northern spotted owl.

Land uses range from intensive forestry to wilderness to municipal supply watersheds. The ecoregion contains Mt. Rainier National Park, Mount St. Helens National Volcanic Monument, and several designated scenic and recreation areas. Lowest elevations frequently are in industrial forest management and small areas of non-industrial private forestry. Small rural communities and dispersed settlements are located in the river valleys. The valleys are also grazed by livestock, produce hay and other crops, and are major travel corridors for tourists and commerce.

ECOREGIONAL CONSERVATION PARTNERSHIPS

Effective conservation of fish, wildlife and biodiversity in Washington requires close coordination and cooperation with many public and private conservation partners. Major partners in the West Cascades ecoregion include:

- U.S. Forest Service (Gifford Pinchot, Mt. Baker-Snoqualmie National Forests, Mount St. Helens National Volcanic Monument)
- National Park Service (Mt. Rainier National Park)
- U.S. Fish and Wildlife Service (Pierce and Franz Lake National Wildlife Refuges)
- Washington Department of Natural Resources
- Washington State Parks and Recreation Commission
- King, Pierce, Lewis, Skamania and Cowlitz Counties

The Washington Department of Fish and Wildlife also works closely on conservation projects with private conservation partners such as The Nature Conservancy, Audubon Washington, Rocky Mountain Elk Foundation, Ducks Unlimited, the Pacific Coast Joint Venture, and a growing number of local land trusts.

Major Plans

A number of major planning efforts involving WDFW and its public and private partners are ongoing or completed that influence and guide the conservation and management of fish and wildlife resources in the West Cascades ecoregion. Included among these major efforts are:

- West Cascades Ecoregional Assessment

- Northwest Forest Plan
- Cowlitz and Lewis Subbasin Plans (2004)
- Northern Rocky Mountain Wolf Recovery Plan (1991)
- Fisher Recovery Plan (2004)
- Marbled Murrelet Recovery Plan (1997)
- Northern Spotted Owl Recovery Plan (1992)
- Mountain Quail Recovery Plan (1993)
- Western Gray Squirrel Recovery Plan (2004)
- Western Pond Turtle Recovery Plan (1999)
- National Wildlife Refuge Comprehensive Conservation Plans (in progress)
- Outline for Salmon Recovery Plans (2003)
- Bull Trout and Dolly Varden Management Plan (2000)

Supporting references to these and other important planning documents are included at the end of this chapter and/or in Appendix **.

SPECIES AND HABITATS OF GREATEST CONSERVATION NEED

*This section provides a short summary of priority species and habitats for the Washington portion of the West Cascades ecoregion. Supporting tables and information for these species and habitats can be found in Appendix**.*

Species of Greatest Conservation Need (SGCN)

*The following species list for the West Cascades ecoregion includes those statewide Species of Greatest Conservation Need (see Appendix **) found in the ecoregion for all or part of their lifecycle, including some target species of the West Cascades Ecoregional Assessment. Supporting tables and information for these species and habitats can be found in Appendix **.*

COMMON NAME	SCIENTIFIC NAME	State Status
Mammals		
Pacific Townsend's big-eared bat	<i>Corynorhinus townsendii townsendii</i>	C
Western gray squirrel	<i>Sciurus griseus</i>	T
Brush Prairie pocket gopher	<i>Thomomys talpoides douglasi</i>	C
Gray wolf	<i>Canis lupus</i>	E
Fisher	<i>Martes pennanti pacifica</i>	E
Wolverine	<i>Gulo gulo</i>	C
Mountain goat	<i>Oreamnos americanus</i>	
Birds		
Common loon	<i>Gavia immer</i>	S
Western grebe	<i>Aechmophorus occidentalis</i>	C

COMMON NAME	SCIENTIFIC NAME	State Status
American white pelican	<i>Pelecanus erythrorhynchos</i>	E
Great blue heron	<i>Ardea herodias</i>	M
Northern pintail	<i>Anas acuta</i>	
Redhead	<i>Aythya americana</i>	
Lesser scaup	<i>Aythya affinis</i>	
Harlequin duck	<i>Histrionicus histrionicus</i>	
Northern goshawk	<i>Accipiter gentilis</i>	C
Golden eagle	<i>Aquila chrysaetos</i>	C
Mountain quail	<i>Oreortyx pictus</i>	
Sandhill crane (greater)	<i>Grus canadensis</i>	E
Marbled murrelet	<i>Brachyramphus marmoratus</i>	T
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	C
Northern spotted owl	<i>Strix occidentalis caurina</i>	E
Vaux's swift	<i>Chaetura vauxi</i>	C
Acorn woodpecker	<i>Melanerpes formicivorus</i>	M
Black-backed woodpecker	<i>Picoides arcticus</i>	C
Pileated woodpecker	<i>Dryocopus pileatus</i>	C
Western bluebird	<i>Sialia mexicana</i>	M
Reptiles		
Western pond turtle	<i>Actinemys (Clemmys) marmorata</i>	E
Racer (snake)	<i>Coluber constrictor</i>	
California mountain kingsnake	<i>Lampropeltis zonata</i>	C
Amphibians		
Larch Mountain salamander	<i>Plethodon larselli</i>	S
Van Dyke's salamander	<i>Plethodon vandykei</i>	C
Cascade torrent salamander	<i>Rhyacotriton cascadae</i>	C
Columbia torrent salamander	<i>Rhyacotriton kezeri</i>	C
Western toad	<i>Bufo boreas</i>	C
Fish		
River lamprey	<i>Lampetra ayresi</i>	C
Pacific lamprey	<i>Lampetra tridentata</i>	
Green sturgeon	<i>Acipenser medirostris</i>	
Lower Columbia steelhead	<i>Oncorhynchus mykiss</i>	

COMMON NAME	SCIENTIFIC NAME	State Status
Inland redband trout	<i>Oncorhynchus mykiss gairdneri</i>	
Lower Columbia coho	<i>Oncorhynchus kisutch</i>	
Pygmy whitefish	<i>Prosopium coulteri</i>	S
Eulachon	<i>Thaleichthys pacificus</i>	C
Leopard dace	<i>Rhinichthys falcatus</i>	C
Mountain sucker	<i>Catostomus platyrhynchus</i>	C
Salish sucker	<i>Catostomus sp. 4</i>	M
Invertebrates		
Beller's ground beetle	<i>Agonum belleri</i>	C
Long-horned leaf beetle	<i>Donacia idola</i>	C
Propertius' duskywing butterfly	<i>Erynnis propertius</i>	M
Mardon skipper butterfly	<i>Polites mardon</i>	E
Chinquapin hairstreak butterfly	<i>Habrodais grunus herri</i>	C
Johnson's hairstreak butterfly	<i>Mitoura johnsoni</i>	C
Puget Sound fritillary butterfly	<i>Speyeria cybele pugetensis</i>	
Valley silverspot butterfly	<i>Speyeria zerene bremnerii</i>	C
Pacific clubtail dragonfly	<i>Gomphus kurilis</i>	
California floater (bivalve)	<i>Anodonta californiensis</i>	C
Western floater (bivalve)	<i>Anodonta kennerlyi</i>	
Winged floater (bivalve)	<i>Anodonta nuttalliana</i>	
Oregon floater (bivalve)	<i>Anodonta oregonensis</i>	
Western ridged mussel	<i>Gonidea angulata</i>	
Western pearlshell	<i>Margaritifera falcata</i>	
Bluegray taildropper (slug)	<i>Prophysaon coeruleum</i>	
Crowned tightcoil (snail)	<i>Pristiloma pilsbryi</i>	
Oregon megomphix (snail)	<i>Megomphix hemphilli</i>	

In the selection process for the Species of Greatest Conservation Need (SGCN) list, all ecoregional assessment target species were considered, but not all ranked high enough to be chosen for the SGCN list. A complete list of West Cascades ecoregional target species can be referenced in the West Cascades Ecoregional Assessment link on the CWCS website.

Species Conservation in the West Cascades Ecoregion

Species of Greatest Conservation Need (SGCN) found in the West Cascades ecoregion (see table above) include those classified by WDFW as Endangered, Threatened, Candidate or Monitor species, as well as species identified by WDFW as needing additional research or

funding attention. A range of conservation actions are recommended for these SGCN species at both the statewide and ecoregional levels. These recommended conservation actions are summarized in a series of matrices included as an appendix of the CWCS. The matrices also display the life history, population status and distribution of these species.

Ecoregion Habitat Overview

The most widespread low elevation forest type (below approximately 3,300 feet) is dominated by Douglas-fir and western hemlock. Some of the lower valleys contain bottomland hardwoods and oak savannas, but these special community types have suffered serious declines. Western red cedar is common in river drainages. Many of the waterways are flanked with broadleaf hardwood species such as bigleaf maple, black cottonwood, and red alder. If not converted to agriculture or urban development, most of these communities have been degraded by exotics and fire suppression. Many of these areas are now being dominated by Douglas-fir forest. Silver fir and mountain hemlock dominate most forests at mid-elevations. At high elevations, parklands and alpine meadows and barrens predominate. Mountain glaciers persist on many of the higher volcanic peaks, including Mount Rainier and Mt. St. Helens.

The following habitat types, which are classified, coded and described in Wildlife and Habitat Relationships in Oregon and Washington (WHROW), are present in the West Cascades ecoregion. In the next section, descriptions are provided for some of the critical habitats for the Species of Greatest Conservation Need.

- Westside Lowlands Conifer-Hardwood Forest
- Westside Oak and Dry Douglas-fir Forest and Woodlands
- Montane Mixed Conifer Forest
- Eastside (Interior) Mixed Conifer Forest
- Lodgepole Pine Forest and Woodlands
- Ponderosa Pine and Eastside White Oak Forest and Woodlands
- Subalpine Parkland
- Alpine Grasslands and Shrublands
- Westside Grasslands
- Agriculture, Pasture and Mixed Environs
- Urban and Mixed Environs
- Open Water: Lakes, Rivers, Streams
- Herbaceous Wetlands
- Westside Riparian-Wetlands
- Montane Coniferous Wetlands
- Bays and Estuaries

(A MAP OF WHROW HABITATS IN THE ECOREGION WILL BE INSERTED HERE)

Priority Habitats in the West Cascades Ecoregion

The following five habitat types have been identified as the highest priority for conservation action in the West Cascades ecoregion. Selection of these habitats was determined by their importance to regional Species of Greatest Conservation need, as well as other factors.

- Westside Lowlands Conifer-Hardwood Forest
- Westside Oak and Dry Douglas-fir Forest and Woodlands
- Westside Grasslands (Herbaceous Balds)
- Westside Riparian-Wetlands

Westside Lowlands Conifer-Hardwood Forest

Westside lowland conifer-hardwood forests comprise the major low montane forests of the West Cascades ecoregion. This habitat type occurs throughout low-elevation areas, except on extremely dry sites. These forests occur in moist to wet habitats and microhabitats and are characterized by more moisture-loving undergrowth species, wet to nearly saturated soils, high abundance of shade- and moisture-tolerant canopy trees, and higher stand productivity. Topography ranges from relatively flat glacial till plains to steep mountainous terrain. This is the most extensive forest in the lowlands on the west side of the Cascades. Other habitat types, especially riparian-wetlands, occur as patches within conifer-hardwood forests.

Lowland conifer-hardwood forests are also found on alluvial floodplains that are confined by valleys and inlets. Dominant broadleaf species are bigleaf maple, red alder, black cottonwood, Sitka willow, red-osier dogwood, and Oregon ash. Conifers tend to increase with succession (i.e. over time) in the absence of major disturbance. Conifer-dominated floodplains are now very rare and not well described; grand fir, Douglas-fir, Sitka spruce and western redcedar are important. Riverine flooding and the succession that occurs after major flooding events are the major natural processes that drive this system. Very early successional stages can be sparsely vegetated or dominated by herbaceous vegetation.

The river bottom valleys and low-elevation forests where conifer-hardwood habitats are found are mostly absent from the existing network of conservation lands. The major exception is the Columbia River Gorge, where a national scenic area managed by the USDA Forest Service includes habitat for high numbers of rare and endemic species.

The West Cascades ecoregion contains one of the few remaining concentrations of old growth conifer-hardwood forest in the state. Old growth forests are of national and global importance because they provide some of the last refugia for species dependent on this habitat type, and perform vital ecological roles, including sequestration of carbon, cleansing of atmospheric pollutants, and maintenance of hydrological regimes.

**Selected Species Closely Associated with
Western Lowlands Conifer-Hardwood Forest
in the West Cascades Ecoregion**

Brush Prairie pocket gopher	Northern spotted owl
Fisher	Bluegray tailed dropper (slug)
Marbled murrelet	Crowned tightcoil (snail)
Oregon megomphix (snail)	

Conservation Problems: The majority of the protected lands in the West Cascades ecoregion occur at higher elevations. Most of the natural ecosystems found at lower elevations have been largely destroyed or degraded. Key problems include:

Forest fragmentation: Habitat fragmentation in the West Cascades ecoregion is generally greatest in the lower elevations and on private lands. Ownership of lower elevation forests is patchy, hindering coordinated management of public and private lands to address conservation needs.

Modification of natural fire regimes: Although Westside forests are not as dependent on natural fire as are Eastside forests, the absence of periodic fires from many areas has resulted in declines in ecosystem integrity and increases in exotic species.

Timber management activities and road building: Incompatible logging practices have reduced the structural complexity of these forests and reduced the abundance of large woody debris, as well as facilitated introduction of invasive plant species.

Low-density development in the valleys and the spread of exotic species are other major threats to the conifer-hardwood forests of the West Cascades.

Conservation Actions: About 15% of the forests in the West Cascades ecoregion are over 80 years old. The presence of larger, publicly owned forest blocks containing older forests enhances the potential for further protection in the ecoregion; however, these blocks of forest are not necessarily protected.

- The West Cascades ecoregion is the nucleus of the Interagency Vegetation Mapping Project (IVMP), which generates land cover data for recovery of the northern spotted owl. Use this data, the West Cascades Ecoregional Assessment, and other habitat assessment data to identify zones of greatest biodiversity and habitat critical for the conservation of ecoregional Species of Greatest Conservation Need.
- Work with public land agencies and willing private landowners to identify and provide more protection for low elevation conifer-hardwood forest, especially mature forest, which provides critical habitat and connectivity for ecoregional Species of Greatest Conservation Need.
- Work with public landowners to protect existing roadless areas and expand the roadless area network where justified for habitat protection and connectivity.
- Work with both public and private landowners to increase the overall connectivity of existing protected areas.
- Work through the Forest Practices Board and directly with forest land management agencies and private landowners to implement forest management prescriptions, including prescribed burns, that will maintain and enhance biodiversity and natural ecosystem function.
- Work with both public and private landowners to control the increasing spread of invasive species such as Scot's broom, colonial bentgrass and common St. Johnswort in conifer-hardwood forests.
- Coordinate volunteer monitoring and involvement. Citizen monitoring programs can be extremely valuable to a restoration program. Through such programs, the public can be educated about the value of lowland conifer-hardwoods forest, long-term stewardship of natural habitats can be emphasized and local governments and agencies can obtain assistance with monitoring projects.

Westside Oak and Dry Douglas-fir Forest and Woodlands

Westside oak and dry Douglas-fir habitat is associated with dry sites or sites with a low-intensity fire regime that was more common before European settlement. The dry sites are typically either shallow bedrock soils or deep gravelly glacial outwash soils. Originally, the vegetation was a woodland or forest dominated by deciduous broadleaf trees, mostly Oregon white oak (*Quercus garryana*). This habitat varies between small patch and large patch in its dynamics. Succession in the absence of fire tends to favor increased shrub dominance in the understory, increased tree density, and increased importance of conifers, with the end result being conversion to a conifer forest.

**Selected Species Closely Associated with
Western Oak and Dry Douglas-fir
in the West Cascades Ecoregion**

Western gray squirrel	Racer (snake)
Acorn woodpecker	Proterops' duskywing butterfly
Pileated woodpecker	Johnson's hairstreak butterfly

Conservation Problems: Widespread conversion of oak savannas and woodland habitat has been severe, and many of the special natural areas in this habitat have already been destroyed or degraded. Opportunities to restore bottomland hardwood forests are limited; oak savannas and woodlands are likely to continue to decline because of the difficulties involved in restoring natural fire regimes and because privately owned areas are under considerable threat from further logging and conversion to agriculture.

Conservation Actions: Work with the Gifford Pinchot National Forest, other public land managers and private timber companies to protect and enhance remaining Oregon white oak and dry Douglas-fir woodlands through a number of measures, including:

- Selectively harvest individual oaks to improve stand age-class and structural diversity.
- Thin encroaching conifers in oak woodlands.
- Retain large, dominant oaks and Douglas-firs and standing dead and dying trees.
- Create snags instead of removing trees.
- Leave fallen trees, limbs and leaf litter for foraging, nesting and denning sites.
- Retain contiguous aerial pathways.
- Conduct prescribed burns where appropriate.
- Acquire contiguous or notable stands of oaks to manage in public ownership.
- Identify oak woodlands that could be protected by private conservation organizations and land trust organizations.
- Work with local governments to designate large, contiguous oak and oak/conifer stands as critical areas under the Growth Management Act.
- Coordinate volunteer monitoring and involvement. Citizen monitoring programs can be extremely valuable to a restoration program. Through such programs, the public can be educated about the value of oak and dry Douglas-fir woodlands, long-term stewardship of natural habitats can be emphasized and local governments and agencies can obtain assistance with monitoring projects.

Westside Grasslands (Herbaceous Balds)

Herbaceous balds are the driest environmental settings within the ecoregion that support continuous vegetation: generally south- to west-facing slopes on shallow or sandy/gravelly soils. They typically occur as isolated sites within a forest matrix. Fire was probably an important process historically on most of these sites, and some of them are threatened by invasion of trees in the absence of disturbance. Vegetation is dominated by perennial bunch grasses, forbs, and mosses. Scattered trees, especially Douglas-fir, are often present. These balds are often rimmed by Oregon white oak stands and provide important transitional habitat for a variety of bird and butterfly species.

**Selected Species Closely Associated
with Westside Grasslands
in the West Cascades Ecoregion**

Western bluebird	Valley silverspot butterfly
California mountain kingsnake	Mardon skipper butterfly
Puget Sound fritillary butterfly	

Conservation Problems: Grassy and herbaceous balds are generally patch habitats distributed in low and high elevation forests. They are often associated with oak woodlands, and thus share the same general threats and preservation actions.

Conservation Actions: Initiate and maintain inventories of important grassy and herbaceous balds. Work with land management agencies and private land owners to protect these habitats from disturbance and development.

Westside Riparian-Wetlands

In the West Cascades ecoregion, this habitat is often interspersed within a mosaic of Westside Lowlands Conifer-Hardwood Forest. This habitat also can include Herbaceous Wetlands and occur adjacent to Open Water habitats. Riparian-wetland habitats are a conservation priority because of their importance for a wide range of terrestrial and aquatic species.

Riparian habitats in the West Cascades ecoregion are composed of vegetation in various stages of development depending on the time since the last disturbance. Riparian plant communities vary depending on the upland plant communities, stream gradient, elevation, soil, aspect, topography, and water quality and quantity. In many cases, riparian corridors in agricultural and urbanized settings within previously forested environments are highly altered. Typically, they appear as narrow strips of shrubs and deciduous trees in non-forested landscapes. Many natural streams have been channelized into drainage or irrigation ditches. Where trees have been removed, banks and channels are often choked with reed canary grass, an aggressive exotic plant that reduces plant and wildlife diversity and blocks streams, which can impede fish passage.

Selected Species Closely Associated with Westside Riparian-Wetlands in the West Cascades Ecoregion	
Western toad	Van Dyke's salamander
Great blue heron	Cascade torrent salamander
Larch Mountain salamander	Columbia torrent salamander
Fisher	Beller's ground beetle
Western pond turtle	Long-horned leaf beetle

Conservation Problems: The Northwest Forest Plan resulted in major improvements in streamside protections on federal lands. However, riparian habitats have been altered and degraded throughout much of the ecoregion in the past due to logging and road building. Construction of dams and reservoirs has also impacted riparian-wetland habitats. Low-density development in valleys and encroachment of non-native species continue to be of particular concern for this habitat.

Conservation Actions: Riparian areas currently receive protection through forest practices policies on private, state, and federal lands. These policies are geared towards timber management activities that maintain stream shade, wood recruitment, and stream bank stability. However, protection and recovery of riparian vegetation is also a critical step in system recovery. Revegetation, for example, is a quasi-active restoration strategy because plantings are initially conducted as a jump-start, but the system is then left to recover on its own. As with other active restoration approaches, environmental stressors such as livestock grazing must be addressed for riparian plantings to be successful.

- Revegetate riparian areas to include initial plantings of native riparian plants.
- Conserve Columbia River Gorge rare riparian plants.
- Restore riparian-wetland integrity through designation of additional protected areas and alternative forest management.
- Manage undeveloped publicly-owned land for conservation of priority habitats and species. Adequately protect RHAs (riparian habitat areas).
- Plan and provide for a network of undeveloped wildlife corridors to connect existing natural riparian areas.
- Encourage public and private forest landowners to manage forested watersheds that maintain an appropriate mix of successional stages and provide connectivity of riparian and upland vegetation as protected travel corridors for wildlife.
- Improve the road drainage network in riparian zones by removing unnecessary culverts, increasing the size of inadequate culverts, or replacing culverts with bridges.
- Coordinate volunteer monitoring and involvement. Citizen monitoring programs can be extremely valuable to a restoration program. Through such programs, the public can be educated about the value of riparian-wetlands, long-term stewardship of natural habitats can be emphasized and local governments and agencies can obtain assistance with monitoring projects.